



**TWC SITE INSPECTION REPORT
GROWTH SYSTEMS INC.
HOUSTON, TEXAS
TXD981600794
TWC DISTRICT 7 SER**

INTRODUCTION

On December 19, 1989, Engineering-Science, Inc. (ES) conducted a site inspection at the Schumacher substation of Growth Systems, Inc. (GSI) site in Houston, Texas (TXD981600794) as part of the PA/SI program. The following report documents the activities performed and information collected during this site inspection.

Site Description/History

Information in this section is based on file information and/or interviews with site representatives.

GSI was a private grounds maintenance business operating at 11811 Charles Street, Houston, Texas, 77041. GSI was purchased by Grounds Management Service (GMS) in October 1985. GSI was in business for 11 years prior to being purchased. GMS had been in business in the Houston area since approximately 1981 and was also involved in grounds maintenance. GMS operated from this site until 1987, when the land was foreclosed. The Texas Department of Agriculture (TDA) applicator license on record in 1984 was number 7824. The GSI site at 11811 Charles Street has been vacant since that foreclosure. GMS and GSI operated substations in the Houston area. Most of the products were used or mixed at the headquarters site on Charles Street. GMS only did limited spot application of Roundup prior to purchasing GSI. The substations are no longer active or are not in existence. There have been no other known applicators operating at this site since the early 1970s.

GMS and GSI were involved in pesticide use for grounds maintenance. Approximately 100 gallons of liquid pesticides and 100 pounds of powdered pesticides were used per year.

The primary products used by GMS and GSI included Roundup, Topsun, orthene, diazinon, and captan. Other pesticides used in smaller amounts included dursban, disyston, lindane, isotox, malathion, sevin, zineb, manzate, kocide, daconil, benomyl, funginex, paraquat, TriMek, Weed-be-Gone, 33 Plus, MSMA, pramitol, surflan, and eptam.

Most of the pesticide handling was conducted at the headquarters site, although pesticide mixtures were also used by the crews at the substations. GSI used a 100-gallon and 200-gallon spray rigs on trucks, four 30-gallon wheel-mounted sprayers, and backpack and shoulder sprayers. The backpack and shoulder sprayers were used by the crews at the substations, such as the Schumacher site. The smaller

SUPERFUND FILE

sprayers were rinsed at the job site and the rinse water was sprayed on the treated area.

GMS purchased pesticides as required and temporarily stored them in a metallic shed at the headquarters site. The spray tanks were cleaned whenever mixtures in the tanks were changed. The tanks were rinsed with a water and bleach (Chlorox) solution. This rinsate was placed in a 55-gallon drum and placed in a drum storage area. The disposal fate of rinsate in these drums is unknown. Occasionally, this rinsewater was discarded on a large concrete pad where it would evaporate. Containers were triple rinsed with the rinsate being added to the mixture to be sprayed. The containers were punctured and placed in the trash and picked up by contract service. Some paper bags were burned at the headquarters site.

Water used by GMS and GSI was supplied by the city of Houston. There is no water well located at the headquarters or the Schumacher substation sites.

Summary of Preliminary Assessment

A preliminary assessment was performed by ES on the GSI headquarters site and its substations on May 6 and May 8, 1986. This assessment consisted of interviews with the vice president/general manager of GMS and a former employee of GSI, a site survey, and site photography.

The preliminary assessment of the GSI sites focussed primarily on the headquarters site at 11811 Charles Street. Photography and site surveys were conducted at the substations, but are not otherwise mentioned.

Project Management/Key Personnel

The TWC project manager for this site inspection is Robert Rountree. The ES project manager is J. David Highland. The inspection team consisted of Brian Vanderglas and Greg Pierson of ES. ES's mailing address is 7800 Shoal Creek, Suite 222W, Austin, Texas 78757, 512/467-6200.

DATA COLLECTION

Inspection - Onsite Records

ES conducted a site investigation at the substation located at 8625 Schumacher Street as requested by the TWC in an August 7, 1989 phone conversation. An Environmental Protection Agency tentative disposition for the Schumacher site recommended a site inspection due to unknown pesticide handling and waste disposal practices.

The inspection of the GSI site on Schumacher Street was conducted on December 19, 1989. At 9:30 A.M., Brian Vanderglas and Greg Pierson met with Gary Hargrave, representative of Village Savings Bank which has foreclosed on the land on Schumacher St., for an interview prior to the site reconnaissance. At the time of the inspection, the temperature was 37°F and the weather was damp. No records relating to the handling of hazardous wastes were available at the site.

Inspection - Onsite Reconnaissance

Upon completion of the interview at 9:40 P.M., a survey of the site was begun. The site, as shown in the site sketch in attachment D, occupies 18,000 square feet. The site is fenced and access is available by a small gate which enters into the parking area, and through a vehicle gate which opens to the road on the north side of the site. The site consists of a warehouse/office complex with a paved parking operations lot. The condition of the drain area for the paved lot received special attention.

There were no pesticide application equipment or empty containers observed at the site. The office building and warehouse were empty and relatively well kept. No conspicuous stains were observed on the pavement inside the warehouse or in the operations area. The vegetation around the perimeter of the site was full and did not exhibit any signs of stress. The pavement in the operations area is slightly sloped so that most of the drainage will flow toward the two small drains located in the middle of the lot.

An underground storage tank which contained gasoline had been removed from the site since the foreclosure. According to Mr. Hargrave, state approved tank removal procedures and inspections were followed during the removal of the tank. There was a large pile of dirt on site which was reportedly brought on to the site as fill material to be placed in the hole produced by the tank removal.

Inspection - Sampling

Upon completion of the site survey, sampling was conducted. The sampling plan was designed to determine what, if any, pesticides have been released at the site.

A background soil sample (0794-1) was taken from a grassy strip located outside of the fenced area between the paved lot and Schumacher street. The location of this background sample was less than ideal, but the area around the site is almost completely paved, leaving little choices for soil sampling. A grab soil sample (0794-2) was taken from the sediment which has built up in the drain area. The primary objective of this sample was to determine the likelihood of release of pesticides to surface drainage. The sample locations are indicated on the site sketch in attachment D.

Requested parameters for the above described samples included lindane, methoxychlor, and malathion. These pesticides were requested because they are insecticides which have been commonly used for domestic application and treatment.

Standard sampling, decontamination, packaging, and shipping procedures were used at this site. The inspection was completed at 10:45 A.M.

The samples taken at the GSI site were kept on ice until shipped to Pan American Laboratories, Inc. (5337 East 14th Street, Brownsville, Texas 78521) via a next day air courier service.

Desktop Data Collection

The following information was obtained from the Bureau of Economic Geology, Geologic Atlas of Texas, Houston Sheet (1982), TDWR Report 203 (March 1976), and The Soil Survey of Harris County (August 1976).

The Beaumont Formation of Pleistocene age outcrops in the area of the site. It is comprised of mostly clay, silt, and sand, and has a maximum thickness of approximately 100 feet. The Beaumont Formation, in the area of the site is dominated by clays and mud of low permeability, high water holding capacity, and poor drainage.

Locally, the Beaumont Formation with the underlying Lissie Formation and the Willis Sand, makes up the Chicot aquifer. The Chicot is the main source of groundwater in the area. The base of the aquifer occurs at a depth of approximately 500 feet. The Evangeline aquifer, which is comprised of the Goliad Sand and the uppermost part of the Fleming Formation, underlies the Chicot aquifer. A number of wells penetrate the two aquifers, which are hydraulically connected, in the area near the Schumacher substation. The potential yield of the aquifers is 500 to 1,000 gallons per minute (gpm). The generalized groundwater flow direction is to the southeast.

Recharge of the Chicot occurs from precipitation on permeable beds of Lissie outcrop. Discharge from the aquifer into streambeds occurs in shallow water zones when water levels are high. Local surface drainage flows north off site and enters the Houston stormwater system.

Refer to attachment B for a generalized cross section of the area and a stratigraphic table showing geologic units and their water-bearing characteristics.

The soil at the site is classified in the Lake Charles-Urban complex. It is characterized as deep, clayey soils. When these soils are dry, deep wide cracks form on the surface. Water enters the cracks rapidly, but when the soil becomes wetted, the cracks are sealed and the water infiltrates into the soil very slowly. Surface runoff is very slow or medium. Internal drainage is very slow, and the permeability is very low.

ANALYTICAL RESULTS

Substances Detected/Concentrations

Sample results in attachment D indicate low concentrations of lindane and methoxychlor were detected in the background soil sample (0794-1). This sample was collected in the grass strip located between the paved lot and Schumacher Street. No pesticides above detection limits were found in the soil sample (0794-2) collected in the sediment leading into the drain area. The respective detection limits of lindane, methoxychlor, and malathion in soil were 0.1 milligrams per kilogram (mg/kg), 0.5 mg/kg, and 0.08 mg/kg. Table 1 contains a summary of the analytical results.

Table 1 Analytical Data Summary

Sample Number	Sample Type	Analytical Parameters	Concentrations
0794-1	Soil	Lindane Methoxychlor Malathion	1.10 mg/kg 1.27 mg/kg <0.08 mg/kg
0794-2	Soil	Lindane Methoxychlor Malathion	<0.1 mg/kg <0.5 mg/kg <0.8 mg/kg

Quality Assurance/Quality Control Information Summary

There were no quality assurance field samples collected for this site.

SOURCE AND PATHWAY CHARACTERISTICS/TARGETS

Source/Waste Characteristics

Possible wastes of concern at the site consist of the residuals from preparation and application of pesticides. They include soils contaminated by spills and/or rinsate disposal and empty pesticide containers. The pesticide residues which may be present in the soil and/or empty containers are considered toxic and may be in solid or liquid form. Lindane and methoxychlor are suspected carcinogens.

Both lindane and methoxychlor are chlorinated hydrocarbons which are considered persistent in soils. Half-life values for lindane range from 266 days to 600 days. Half-life values for methoxychlor are greater than 180 days.

Lindane is one of the more mobile and soluble chlorinated hydrocarbons. It can readily be leached through a soil column by additions of water, although the bulk of the concentrations remain near the surface. Methoxychlor, on the other hand, is relatively immobile in the soil.

Air Pathway/Targets

Pesticides in contact with soil may bind to the soil and be carried with soil particles by wind. Inhalation of air carrying pesticide-contaminated soil particles may result in exposure to pesticides. Low concentrations of lindane and methoxychlor in soil at the site are indicated in the attached analytical reports.

For this site, the maximally exposed individuals are the employees of businesses directly adjacent to the site. No individuals currently work at the site. The population is approximately 80 within ¼ mile, 300 within ½ mile, 1,200 within 1 mile, 4,000 within 2 miles, 12,000 within 3 miles, and 40,000 within 4 miles. The shortest distance to commercial facilities from this site is less than ¼ mile. The shortest distance to single family residential areas is less than ½ mile, to multifamily residential is less than ½ mile, to public use areas is approximately ½ mile, and to

agricultural areas is greater than 4 miles. There are no known sensitive environments within 4 miles of the site.

Groundwater Pathway/Targets

Pesticide spills and rinsates disposed of on the ground may migrate to groundwater. Low concentrations of methoxychlor and lindane in soil at the site are indicated in the attached analytical reports.

The site is located in a potential recharge zone of the Chicot aquifer. The depth to groundwater at the site is less than 400 to 600 feet to the little used Evangeline aquifer and 150 to 300 feet to the Chicot aquifer. A nearby well draws water supply from 250 to 320 feet. Soils in the area of the site have a moderate permeability (10^{-3} to 10^{-4} cm/sec). The city of Houston uses a blend water system to supply drinking water, so wells within 4 miles of the site may serve as many as 500,000 individuals. Neither of the aquifers is known to be a sole source aquifer.

Surface Water Pathway/Targets

Pesticides may be carried with sediment by surface runoff to receiving waters. Low concentrations of methoxychlor and lindane in soil at the site are indicated in the attached analytical reports.

Runoff from the site enters the Houston stormwater system within $\frac{1}{4}$ mile from the site which may eventually drain into Houston's bayou network. Thus, no persons take drinking water from the receiving water of the site drainage. No recreational use is indicated within 15 downstream miles of the site. No known sensitive environments are located within 15 downstream miles of the site.

The surface slope at the site is 0 percent to $\frac{1}{2}$ percent toward the drains in the center of the paved lot on site. There is also a slight slope to the north out the main gate of the paved lot. A low potential for surface water release from the site exists. The upgradient drainage area is approximately $\frac{1}{2}$ square mile and the 2-year, 24-hour rainfall event is $4\frac{1}{2}$ inches. The location of the site relative to the flood plain is indicated on the flood plain map in attachment D.

Onsite Exposure Pathway/Targets

Primary onsite exposure risk is due to airborne pesticide residues. In addition, the area of contaminated soils at the site is located in a grass strip outside of the fenced former operations area of GMS. Some potential for dermal contact with contaminated soils exists.

Since the site is located in an urban area, a large number of workers and private citizens risk potential exposure to airborne pesticides. The maximally exposed individuals are the employees of neighboring businesses. Approximately 1,200 persons live within 1 mile of the site and approximately 300 persons attend school within 1 mile of the site.

CONCLUSIONS

There have been no previous investigations at the site other than the preliminary assessment performed prior to this investigation. Analytical results in

attachment D indicate low concentrations of lindane and methoxychlor in the soil in the grass strip between the operations area and Schumacher Street. No other pesticides were detected in the sample collected in the drain area in the center of the former operations area.

The information obtained during this site investigation indicates low potential offsite release of pesticides via the surface runoff pathway. The concentrations of the pesticides found in the soil are low. Additionally, nothing was detected in soil sample 0794-2 which is located in the immediate drainage path from the presumed operating area at the site. The low concentrations of pesticides found in soil and the low permeable conditions of this urban area, suggest a low potential for shallow aquifer recharge. The site is located in the city of Houston, Texas, with several schools, public parks, and medical facilities located within 1 mile of the site. Based on the above information, and the fact that operations at the site have been discontinued, a low apparent seriousness is assigned to the site.

Attachment A
Bibliography

BIBLIOGRAPHY

- The Roads of Texas*, Fredricksburg, Texas: Shearer Publishing, 1988.
- Atlas of Texas Public School Districts*, Austin, Texas: Texas Education Agency, 1983.
- Texas Public School Fall Membership by Ethnic Group, Campus Report-Count and Percent 1987-1988*. Austin, Texas: Texas Education Agency, 1988.
- County Business Patterns, 1985, Texas*. Washington D.C.: U.S. Department of Commerce, Bureau of the Census, 1987.
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- Texas Almanac (1988-1989)*. Dallas, Texas: Dallas Morning News, 1987.
- Sanborn, J.R., B.M. Francis, and R.L. Metcalf. *The Degradation of Selected Pesticides in Soil: A Review of the Published Literature*. EPA-600/9-77-022, 1977.
- Farm Chemicals Handbook, 1986*. Wiloughby, Ohio: Farm Chemicals, 1986.
- Superfund Public Health Evaluation Manual*. Washington D.C.: U.S. Environmental Protection Agency, 1986. EPA 540/1-84 060.

Attachment B

- ✓ **Stratigraphic and Hydrogeologic Information**
- NA **Site Inspection Supplemental Report(s)**
- NA **Groundwater Monitoring System Supplemental Form**
- NA **Residential Well Sampling Information**
- NA **Boring Logs and/or Monitoring Well Construction
Land Design**

Table 1.--Correlation of geologic and hydrologic units

Geologic classification			Colorado, Lavae, and Wharton Counties	Houston district (Wood and Gibbs, 1963)	Houston district (Jorgensen, 1975)	Brazoria County (Sandeen and Vogelbein, 1973)	Austin and Waller Counties (Wilton, 1967)	Galveston County (Petitt and Winegar, 1977)	Houston district (Lang, Winegar, and White, 1978)	Fort Bend County (Woodman, 1977)
System	Series	Stratigraphic unit								
TERTIARY	Pliocene and Miocene	Quaternary alluvium	Chicot aquifer	"Confining" layer and Alta Loma Sand of Bone (1943)	C h i c o t a q u i f e r	C h i c o t a q u i f e r	Alluvium of the Brazos River	Beach and dune sand	Alluvial deposits	C h i c o t a q u i f e r
		Beaumont Clay								
		Lissie Formation								
		Montgomery Formation								
QUATERNARY	Pliocene	Sentry Formation	Evangelina aquifer	Heavily pumped layer	C h i c o t a q u i f e r	C h i c o t a q u i f e r	Evangelina aquifer	Beach and dune sand	Alluvial deposits	C h i c o t a q u i f e r
		Willis Sand								
		Colled Sand								
		Flaming Formation								
		Oakville Sandstone								
		Upper Catahoula								
		"Anahuac" Formation								
		"Yria" Formation								
		Jackson Group								
		Whitcomb Formation								
QUATERNARY	Pliocene	Colled Sand	Evangelina aquifer	Heavily pumped layer	C h i c o t a q u i f e r	C h i c o t a q u i f e r	Evangelina aquifer	Beach and dune sand	Alluvial deposits	C h i c o t a q u i f e r
		Flaming Formation								
		Oakville Sandstone								
		Upper Catahoula								
		"Anahuac" Formation								
		"Yria" Formation								
		Jackson Group								
		Whitcomb Formation								
		Colled Sand								
		Flaming Formation								

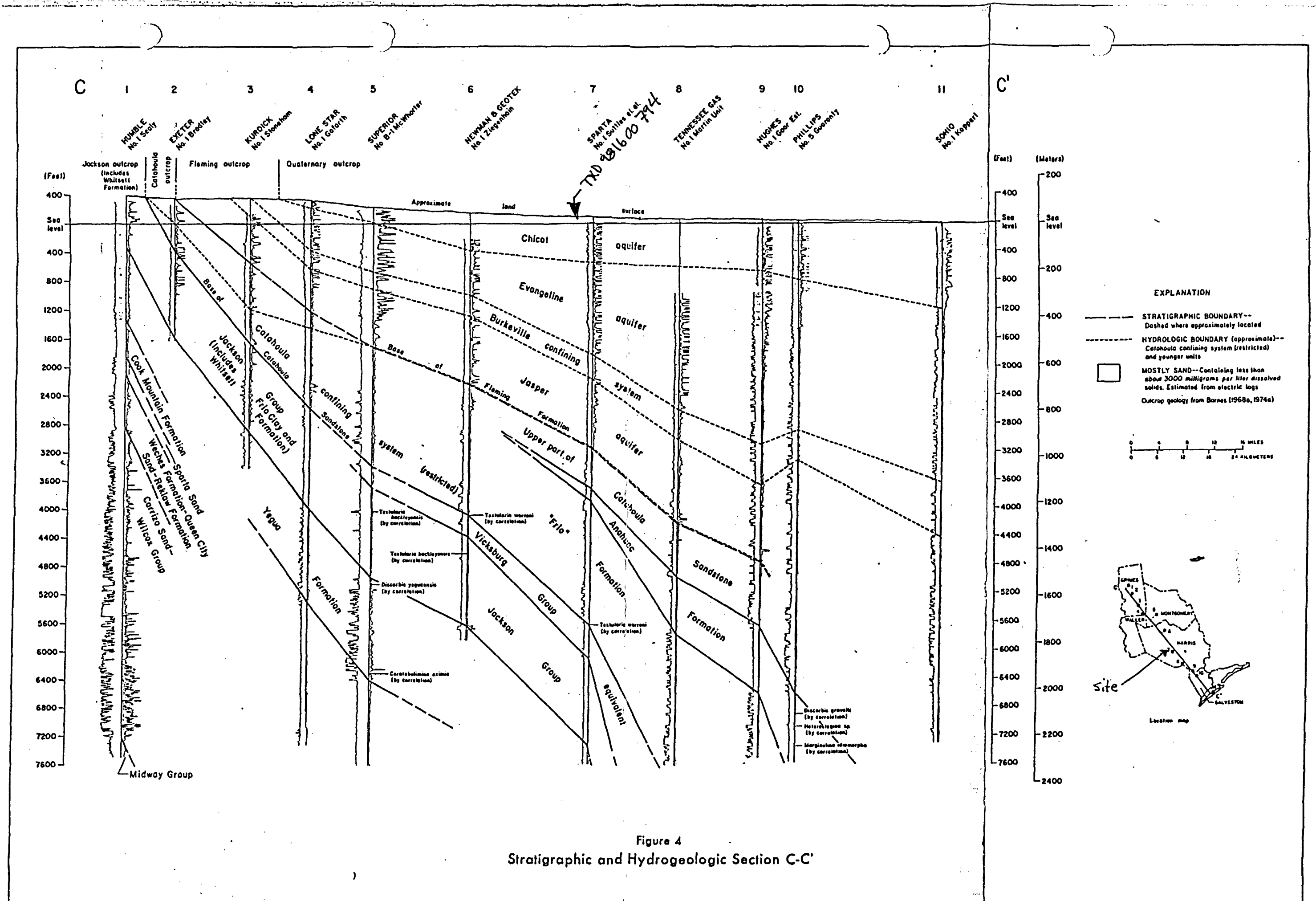


Figure 4
Stratigraphic and Hydrogeologic Section C-C'

Attachment C

NA **Groundwater Monitoring Data**

NA **Report(s) from Previous Site Investigation(s)**

Attachment D

- ☒ **Site Sketch**
- ☒ **Laboratory Data**
- ☒ **Chain-of-Custody Form(s)**
- ☒ **Topographic Map**
- ☒ **Floodplain Map**
- ☒ **Photographs**



pan american laboratories. inc.

Analytical and Consulting Chemists

5337 East 14th Street Brownsville, Texas 78521 (512) 831-4266 or 831-4245

January 17, 1990

CERTIFICATE OF ANALYSIS

For Engineering Science, Inc.
7800 Shoal Creek Blvd. Suite 222 West
Address Austin, Texas 78757
Project No.: AU095.98 Project Name: TXD 981600794
Sample marked Soil Off Site Drain 0794-1
Received December 20, 1989 Lab. No. 101694

<u>Analysis</u>	<u>Extraction Date</u>	<u>Analysis Date</u>	<u>Units</u>	<u>Analytical Results</u>
Lindane	12/27/89	01/05/90	mg/kg	1.10
Methoxychlor	"	01/08/90	"	1.27
Malathion	"	01/05/90	"	<0.08

RESPECTFULLY SUBMITTED,

PAN AMERICAN LABORATORIES. INC.

Mary Lipps

Unless otherwise stated, sample
was submitted by Client



pan american laboratories, inc.

Analytical and Consulting Chemists

5337 East 14th Street Brownsville, Texas 78521 (512) 831-4266 or 831-4245

January 17, 1990

CERTIFICATE OF ANALYSIS

For Engineering Science, Inc.
7800 Shoal Creek Blvd. Suite 222 West
Address Austin, Texas 78757
Project No.: AU095.98 Project Name: TXD 981600794
Sample marked Soil Drain Area in Lot 0794-2
Received December 20, 1989 Lab. No. 101695

<u>Analysis</u>	<u>Extraction Date</u>	<u>Analysis Date</u>	<u>Units</u>	<u>Analytical Results</u>
Lindane	12/28/89	01/05/90	mg/kg	<0.1
Methoxychlor	"	01/08/90	"	<0.5
Malathion	"	01/05/90	"	<0.08

RESPECTFULLY SUBMITTED,

PAN AMERICAN LABORATORIES, INC.

Mary Lipps

Unless otherwise stated, sample
was submitted by Client

Engineering-Science Inc

7800 Shoal Creek Blvd, Suite 222W

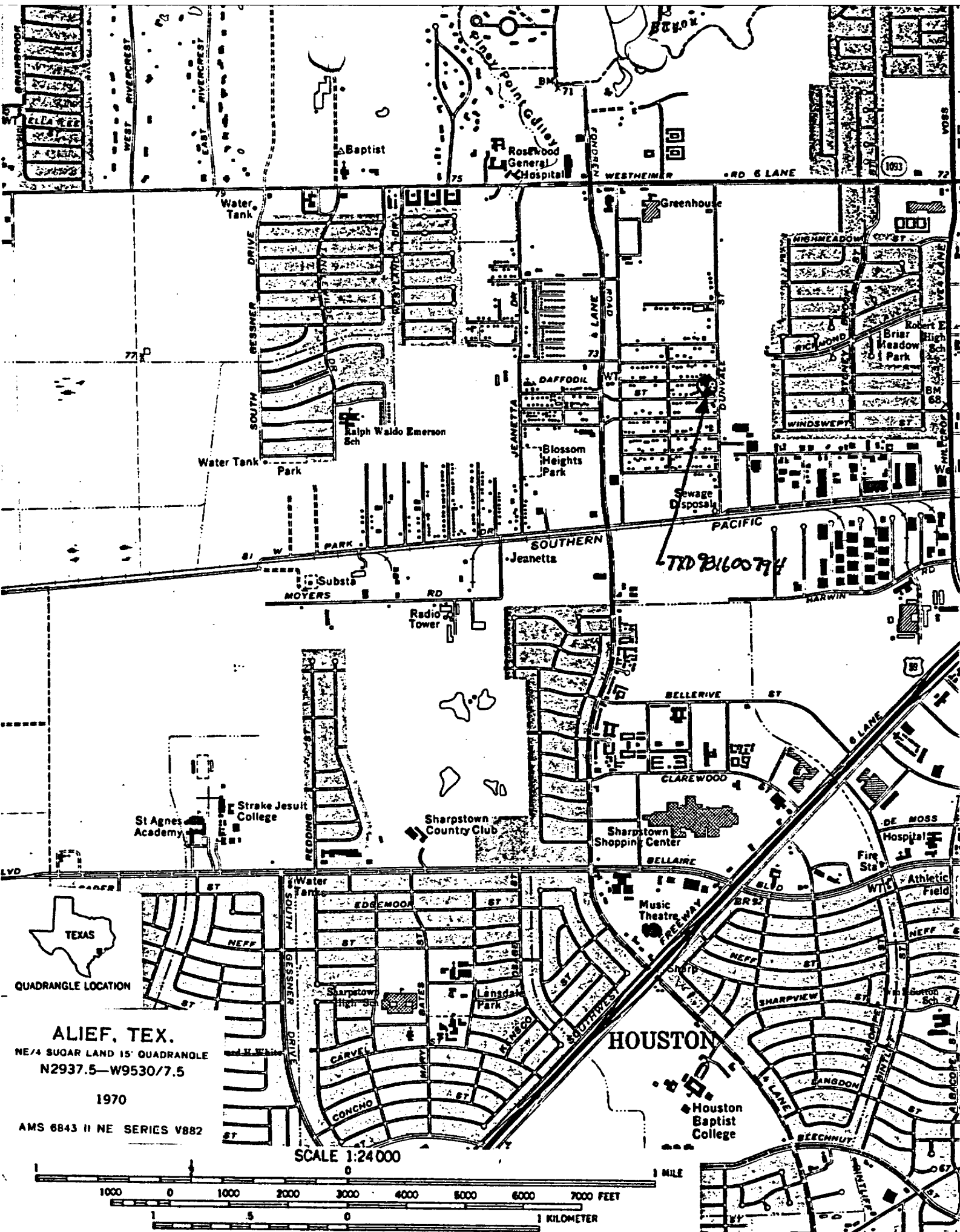
Austin, Texas 78722 78757

512/467-6200

CHAIN OF CUSTODY RECORD

[illegible]

White: laboratory returns with data, yellow: laboratory copy, pink: sampler copy



QUADRANGLE LOCATION

ALIEF, TEX.

NE 1/4 SUGAR LAND 15' QUADRANGLE
N2937.5-W9530/7.5

1970

AMS 6843 II NE SERIES V882

SCALE 1:24 000

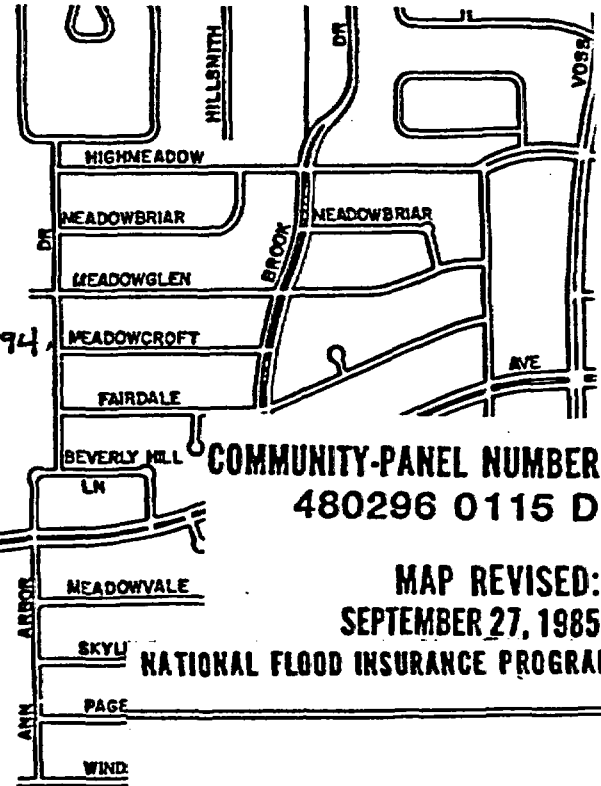
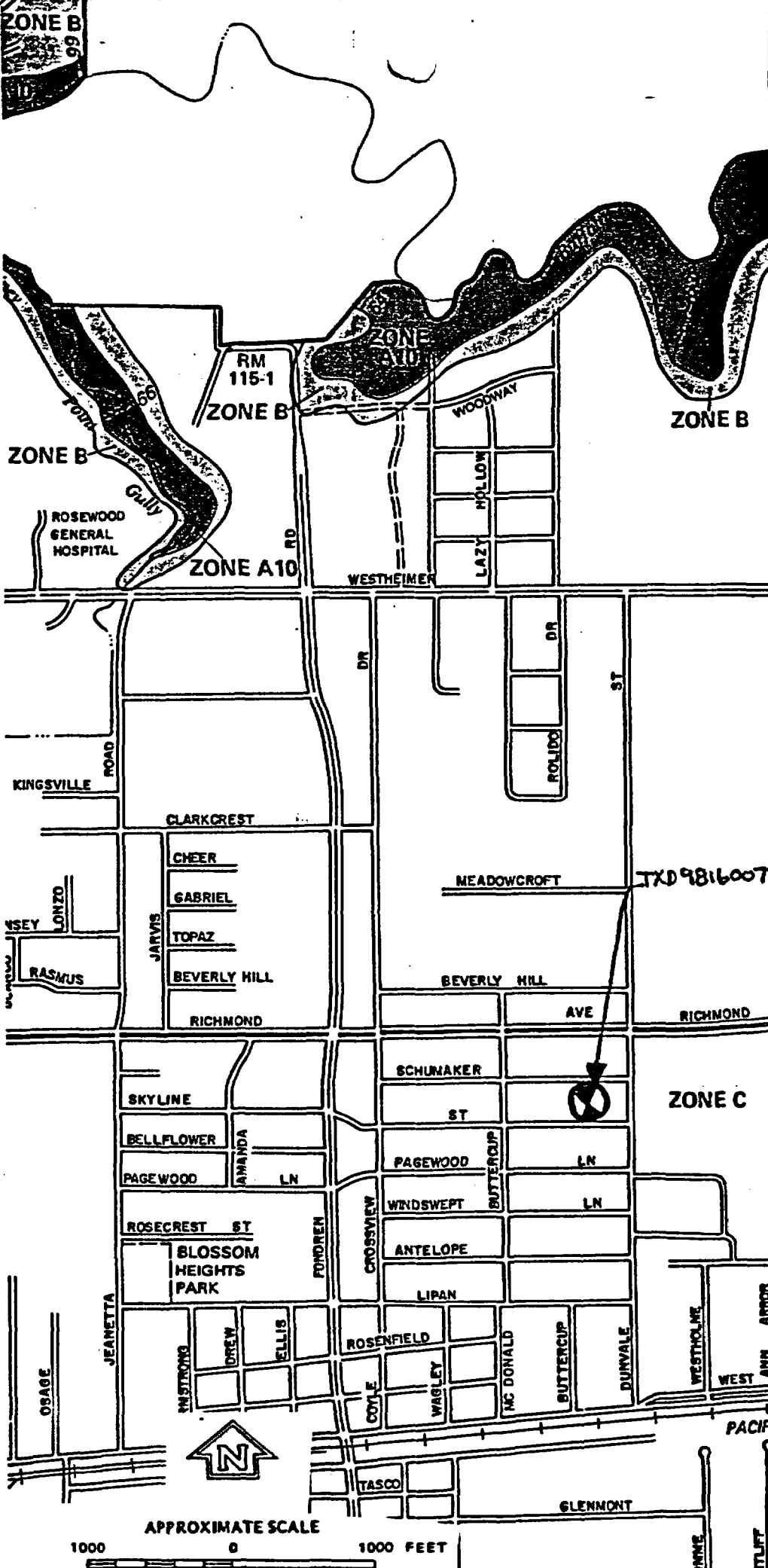
CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL

ZONE B
99

EXPLANATION OF ZONE DESIGNATIONS

EXPLANATION

- A** Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
- AD** Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- AH** Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
- A-30** Areas of 100-year flood; base flood elevations and flood hazard factors determined.
- A99** Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
- B** Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
- C** Areas of minimal flooding. (No shading)
- D** Areas of undetermined, but possible, flood hazards.
- V** Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
- I-V30** Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.



COMMUNITY-PANEL NUMBER
480296 0115 D

MAP REVISED:
SEPTEMBER 27, 1985
NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
HOUSTON,
TEXAS
HARRIS COUNTY,
FORT BEND COUNTY
MONTGOMERY
COUNTY

APPROXIMATE SCALE





②+③

Photographer / Witness

B. Vanderglas / G. Pierson

Date / Time / Direction

12/19/89 / 09:55 / S, SE

Comments: Growth Systems

8625 Schumacher - Panorama

former
of pavement in work area.

∴ cold, rainy 40°F



(4)+(5)

Photographer / Witness

B. Vanderklas / G. Pierson

Date / Time / Direction

12/19/89 / 09:55 / SE, E

Comments: Growth Systems

8625 Schumacher - Continuation
of Panorama of site with photos 2+3.

Cold, rainy and 40°F.



⑥

Photographer / Witness

B. Vanderglas / G. Pierson

Date / Time / Direction

12/19/89 / 10:10 / South

Comments: Growth Systems

Background soil sample

location (0794-1).



⑦

Photographer / Witness

B. Vanderglas / G. Pierson

Date / Time / Direction

12/19/89 / 10:15 / West

Comments: Growth Systems

Drain area soil sample

location (0794-2).

Photographer / Witness

Date / Time / Direction

Comments: _____